

November 15, 2022

SR Land, LLC % Jim Morley 20 Boulder Crescent, Suite 200 Colorado Springs, CO 80903

> When replying, please refer to: Homestead North F3 - Pond A Dam Non-Jurisdictional Detention Pond NOI Water Division 2, Water District 10

**SUBJECT:** Signed Notice of Intent to Construct a Non-Jurisdictional Water Impoundment Structure

Dear Mr. Morley,

Our office is in receipt of a Notice of Intent (NOI) to Construct a Non-Jurisdictional Water Impoundment Structure for the subject dam. The impoundment is to be located adjacent to Sand Creek, tributary to Fountain Creek, tributary to the Arkansas River, with the filling source to be Stormwater for Temporary Detention.

In accordance with Rule 11.1 of the Colorado Rules and Regulations for Dam Safety and Dam Construction, the hazard of this dam has been assessed as Low based on the construction drawing plans submitted with the NOI. A copy of the signed NOI is attached. An electronic copy will be maintained with the Division of Water Resources.

Please note the following:

- This structure must be designed and constructed to standards outlined in 37-92-602(8) for stormwater detention facilities.
- Because this structure is located on a tributary to Fountain Creek, the structure can only operate pursuant a Colorado Discharge Permit System Municipal, Separate Storm Sewer System Permit issued by the Department of Public Health and Environment Pursuant to Article 8 of Title 25, C.R.S.
- In the event groundwater is encountered during construction of the pond, the pond must be backfilled so as not to expose groundwater until such time as: 1) a well permit has been obtained for the groundwater pond pursuant to CRS §37-90-137, or 2) the pond is lined in accordance with the document, "State Engineer Guidelines for Lining Criteria for Gravel Pits," dated August 1999.

The requirements and recommendations provided herein are based on our review of the safety and water administration aspects of the proposed dam and the information provided in the

submitted NOI. These requirements and recommendations create no liability for the State of Colorado should the dam fail for any reason. Please be aware that it is in the owner's best interest to construct, operate, and maintain the structure in a safe manner, as he or she may be held liable in civil court for any downstream damages resulting from failure of the dam. A copy of Specifications for Construction of Non-Jurisdictional Dams is provided to assist you in the construction of a sound structure.

Finally, please be aware of any other permitting or regulatory requirements associated with the construction of a water impoundment structure, including but not limited to county and/or municipal regulations, and wetland permitting through the U.S. Army Corps of Engineers (see www.usace.army.mil for regional contact information).

The plans reviewed in this determination are submitted as part of the Developmental Approval process. Prior to the operation of this structure, please provide notice of completion of construction and as-constructed plans in PDF form including as constructed Stormwater Detention and Infiltration Data Sheet. Additionally, prior to the operation of this structure, notice must be provided pursuant to 37-92-602(8)(d) to the substitute water supply plan notification list maintained by the state engineer pursuant to section 37-92-308 (6) for the water division in which the facility is located.

If you have any questions regarding this approval, please contact Water Commissioner, Jacob Olson, at (719) 227-5291 or via email to jacob.olson@state.co.us, or Dam Safety Engineer, Brian McCormick, at (719)-227-5294, or via email to brian.mccormick@state.co.us,

Sincerely,

Bill W. Jyner

Bill W. Tyner, P.E. Division Engineer, Division 2

Enc:

Signed Notice of Intent to Construct a Non-Jurisdictional Water Impoundment Structure Specifications for Construction of Non-Jurisdictional Dams Completion of Construction Form

Ec: Brian McCormick, P.E., Dam Safety Engineer Jacob Olson, District 10 Water Commissioner Laserfiche File



# COMPLETION OF CONSTRUCTION

DAM ID.\_\_100594\_\_\_

Upon the completion of the <u>Homestead North F3 - Pond A Dam</u>, Subject of the Notice of Intent to Construct a Non-Jurisdictional Dam under the Receipt above, location in Sec.<u>33</u> Twp. <u>12</u> S Rng. <u>65</u> W ; UTM NAD83, 13S Northing <u>4313958</u>, Easting <u>529075</u>.

Indicate in the blank at the bottom of this form, the date of completion of construction and return to:

Colorado Division of Water Resources Division 2 310 East Abriendo Ave, Suite B Pueblo, CO 81004

Date of Completion: \_\_\_\_\_

Signature of Owner

Date

August 16, 2022



**Colorado Division of Water Resources** 310 E. Abriendo Ave., Suite B

Pueblo, CO 81004

RE: Non-Jurisdictional Water Impoundment Structure Notice Homestead North at Sterling Ranch Filing 2, El Paso County

JR Engineering is performing civil engineering services for the proposed Homestead North at Sterling Ranch Filing 2 development northeast of the intersection of Vollmer Road and future Briargate Parkway in El Paso County. The development is comprised of urban residential lots, tracts roadways and utilities.

As part of this development, one (1) full spectrum detention pond is proposed. The pond is identified as Pond A. The pond will have an embankment on the downhill side but, in my opinion, the pond is non-jurisdictional and provide no public exposure in the event of embankment failure as they are adjacent to the Sand Creek drainageway. Groundwater is not anticipated to be encountered based on the depth of excavation and soils report completed by Entech Engineering. In the event groundwater is encountered, your office will be notified.

I have attached the NOI and the grading/pond plans for the pond. I have also attached an overall vicinity map to help define the location of the proposed pond.

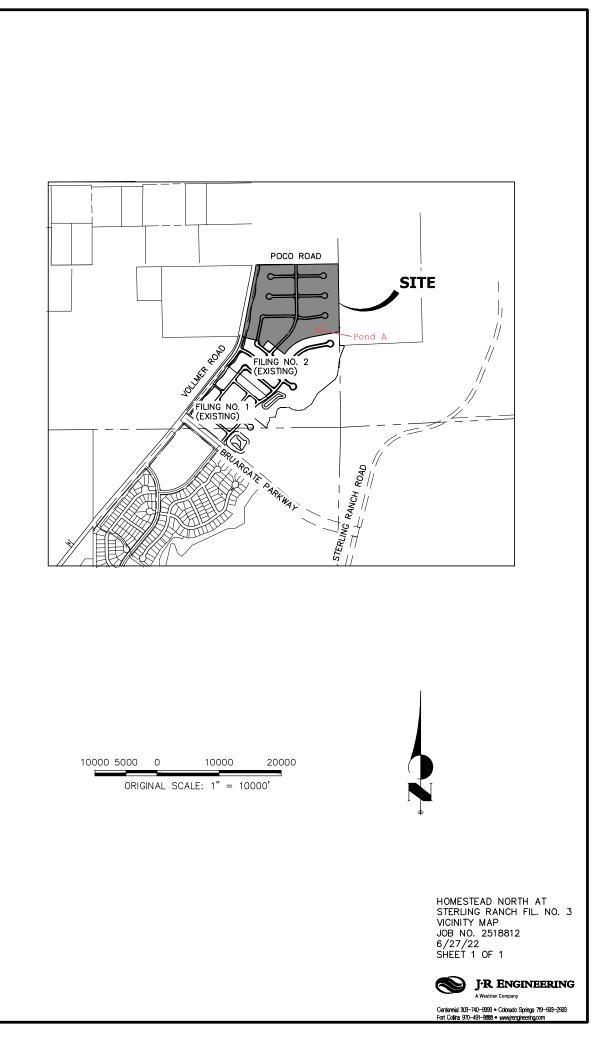
If additional information or clarification is needed to support this submittal, please feel free to contact me.

Respectfully submitted,

**JR ENGINEERING, LLC** 

Mike Bunlitt

Mike Bramlett, PE Client Manager Ph: (303) 267-6240 Cell: (719) 659-7679 Email: mbramlett@jrengineering.com





COLORADO Division of Water Resources Department of Natural Resources www.water.state.co.us P 303.866.3581

### NON-JURISDICTIONAL WATER IMPOUNDMENT STRUCTURE<sup>1</sup>

This notice is required per Section 37-87-125, C.R.S. (1998) and must be submitted to the Division Engineer's Office a minimum of 45 days prior to construction.

#### **OWNER INFORMATION**

Name: SR LAND, LLC	Telephone/E-Mail: ( <u>719</u> )	491-3024 / јмогі	LEY3870@AOL.COM
Address: 20 BOULDER CRESCENT, SUITE 200			80903
Street / P.O. Box/ Rural Route	City		Zip Code
Responsible Person: <u>JIM MORLEY</u>	Telephone/E-Mail:	(719)491-3024	
Address: 20 BOULDER CRESCENT, SUITE 200 Street / P.O. Box/ Rural Route	COLORADO SPRINGS	CO	80903
	City		Zip Code
Contractor: TO BE DETERMINED.	Telephone/E-Mail: (	SE DETERMINED.	
STRUCTURE INFORMATION			
Name of Dam: HOMESTEAD NORTH F3 - POND A	Water D	vivision: 2	Water District:10
Location: (Provide Section, Township, Range, and		t of dam above sti	eamline/outlet)
- Section: <u>28</u> , Township: <u>12S</u> , Range: _			
- Northing <u>4313958.13</u> meters, Easting _	529075.15	_meters ( <i>Datum sl</i>	nould be UTM, NAD 83)
Dam Dimensions:			
- Vertical Height <sup>2</sup> : $5.9$ ft., Length: $350$ ft.,	Crest Width: <u>10</u> ft.,	Slopes: U/S:	_(H:1V), D/S4 (H:1V)
Reservoir:			
- Surface Area <sup>1</sup> :0.8acres, Capacity <sup>1</sup> : _ *(If drainage area is unknown leave blank and a s			30.0acres
Emergency Spillway: (See Table 1, Spillway Sizing	g Guidelines)		
- Bottom Width: ft., Side Slopes:	<sup>4</sup> H:1V, Freeboa	rd <sup>3</sup> :_ <sup>2.0'</sup> ft	
Outlet Conduit Type: RCP	, Size:_ <sup>30"</sup> _ inches	s, Location: SAND	CREEK
Stream Name or Water Source <sup>4</sup> : <u>SAND CREEK</u>	Proposed	Water Use: <u>FULL</u>	SPECTRUM DETENTION POND
Water Court Case <b>or</b> WDID : (Water District Identification Number)	Dam	dor	8/16/22
	Signature	V / )	Date
Office Use Only			
DIVISION ENGINEER'S REQUIREMENTS:			
<b>Dam I.D.</b> 100594	Bill	W. Lyner	11/15/2022
		of Division Engine	er Date
<ul> <li><sup>1</sup> A "Non-Jurisdictional Structure" is a dam creating a reservoir with a ca of 10 feet or less. Non-jurisdictional size dams are regulated and subji?</li> <li><sup>2</sup> "Vertical Height" is measured from the elevation of the lowest point of 1 occurs along the longitudinal centerline of the dam up to the crest of th 3 "Freeboard" is the vertical distance from the bottom of spillway to the centerline of the longitudinal centerline of the lowest point p</li></ul>	ect to the authority of the State Engir the natural surface of the ground or t re emergency spillway of the dam.	neer consistent with section the invert of the outlet con	ons 37-87-102 and 37-87-105 C.R.S.

<sup>4</sup> If construction in reservoir intercepts groundwater, a well permit is required. (Well permit applications can be found at <u>www.water.state.co.us</u>)



COLORADO Division of Water Resources Department of Natural Resources

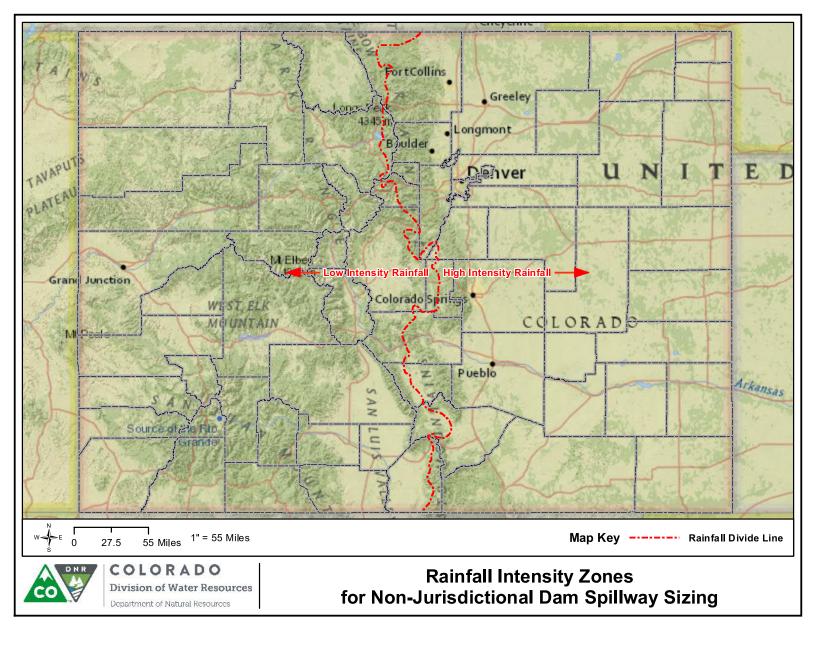
### Table 1 DAM SAFETY BRANCH Spillway Sizing Guidelines for Non-Jurisdictional Dams

Drainage Area (Acres)	Minimum Recommended Bottom Width <sup>1</sup> (Feet) Low Intensity Rainfall Zone	Minimum Recommended Bottom Width <sup>1</sup> (Feet) High Intensity Rainfall Zone
175	8	8
225	8	10
275	8	12
325	8	15
375	10	17
425	11	19
475	12	21
525	13	24
575	15	26
625	16	28
675	17	30
725	19	33
775	20	35
825	21	37
875	22	39
925	24	42
975	25	44
1025	26	46
1075	28	48
1125	29	51
1175	30	53
1225	31	55
1275	33	57
1325	34	59
1375	35	62
1425	37	64
1475	38	66

<sup>1</sup>Minimum recommended bottom width for drainage areas less than 175 acres is 8 feet



**Spillway Section** 

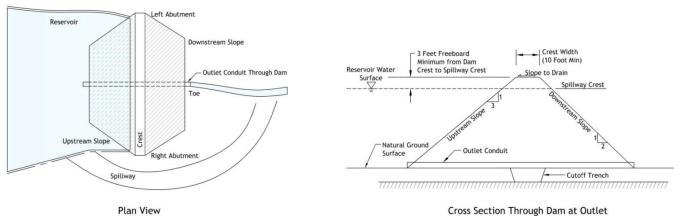




### DAM SAFETY BRANCH Specifications for Construction of Non-Jurisdictional Dams

Site Selection:

- Foundation soils should be firm to provide adequate support for the embankment and should have low permeability to allow for water retention. Site selection should consider potential downstream property damage in the event of a dam failure. Construction of dams in boggy areas, areas with non-uniform fractured rock, or sands/gravels is not recommended and an engineer should be hired to evaluate the site conditions. Any part of the reservoir basin excavated below grade cannot expose groundwater.
- Embankment Design:
  - Backfill material to be used for construction of the cutoff trench and embankment should be a suitable clay material and contain no material larger than 6 inches in diameter.
  - The upstream slope should be constructed with a slope no steeper than 3:1, and the downstream slope should be no steeper than 2:1 (see cross section below). The dam crest should have a minimum width of 10 feet and the surface should be graded with positive drainage toward the reservoir basin.
  - It is recommended that rock rip rap or other suitable material be placed on the upstream slope of the embankment to protect it from wave action. A suitable gravel or geosynthetic material should be placed under the rip rap to prevent fine material from washing out from behind the larger rock.
  - The embankment should be fenced to restrict livestock from accessing the dam since they damage the protective vegetation and increase erosion.
- **Embankment Construction** 
  - The topsoil and all organic material should be removed from the foundation of the proposed dam site. Organic soil should only be reused for placement on the completed embankment to promote the re-growth of vegetation.
  - A cutoff trench should be excavated under the full length of the centerline of the dam with sloping sides (1:1 min.), a minimum bottom width of 3 feet and a depth of 3 feet.
  - The foundation of the dam should be scarified/ripped to a depth of 6-inches to provide proper contact between the native foundation and embankment. This surface should then be moisture treated before placement of fill.
  - Fill material should be placed in layers not exceeding 12 inches in thickness prior to compaction. Suitable backfill material should have enough clay and moisture content to roll a small ball by hand. If this cannot be done, the soil is likely too dry or does not have adequate clay content.
  - Each lift should be thoroughly compacted using a sheeps foot compactor. Care should be taken not to allow the top layers of the soil to dry out between placement of lifts.
  - Fill should be placed in uniform lifts that cover the entire embankment length and width.
- Outlet
  - Unless a waiver is granted in writing by the Division Engineer, all non-jurisdictional dams require an outlet conduit positioned at the natural low point of the reservoir basin. A minimum diameter of 12 inches is recommended and should be controlled at the upstream end by a valve and trash rack.
- **Emergency Spillway** 
  - The spillway should have sufficient width to provide capacity to route the runoff from the drainage basin above the dam during rainfall/runoff events.
  - The emergency spillway should be located on natural ground far enough away to prevent erosion of the dam embankment. A spillway over the dam embankment is not acceptable.
  - A minimum of 3 feet of freeboard is required from the bottom of the emergency spillway to the top of the dam.
  - To determine the minimum spillway width, see the attached table for your area and drainage basin size.
- **Example Plan View and Cross Section**



Plan View

## **Stormwater Detention and Infiltration Design Data Sheet**

Workbook Protected

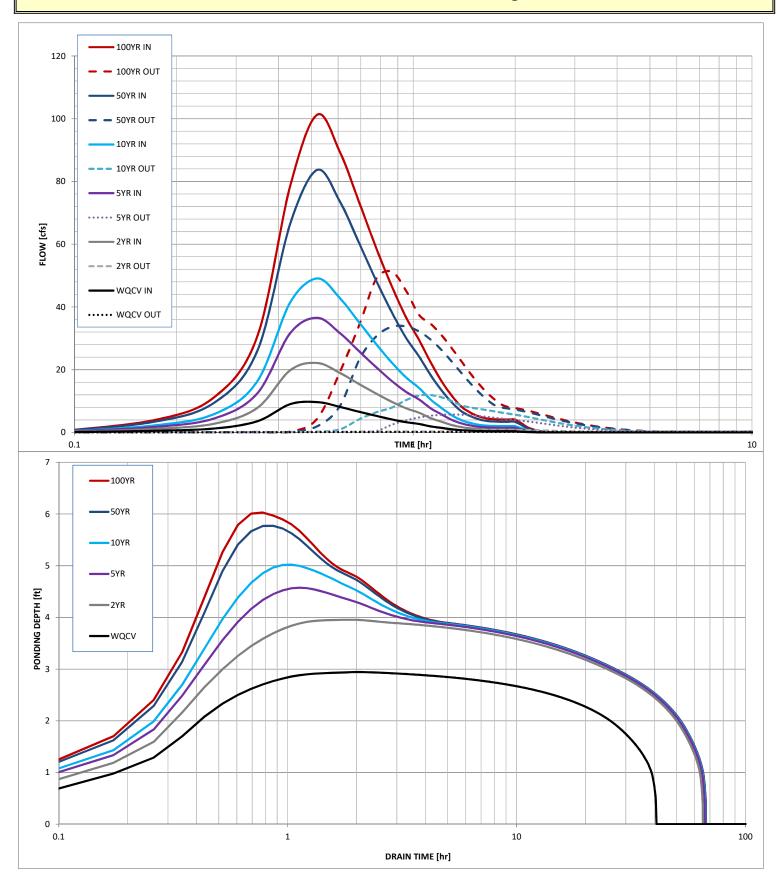
Worksheet Protected

Stormwater Facility Name: Pond HNF3- Pond A

#### Facility Location & Jurisdiction: Sterling Ranch Sudivision, Vollmer Road, El Paso County / El Paso County

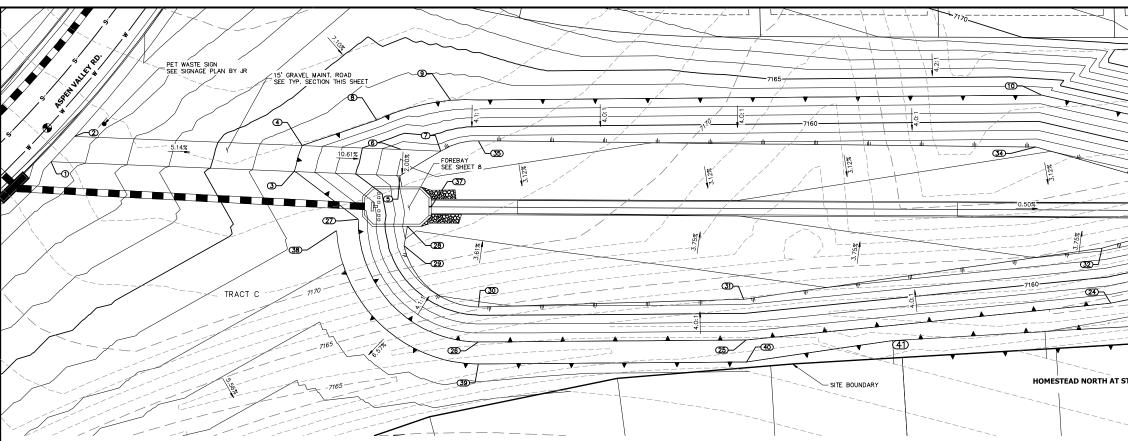
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	Routed Hydro	graph Results					<b></b>
Design Storm Return Period =	WQCV	2 Year	5 Year	10 Year	50 Year	100 Year	
One-Hour Rainfall Depth =		1.19	1.50	1.75	2.25	2.52	in
Calculated Runoff Volume =	0.452	1.037	1.715	2.303	3.898	4.711	acre-f
OPTIONAL Override Runoff Volume =	0.45						acre-
Inflow Hydrograph Volume =	0.451	1.037	1.715	2.303	3.898	4.710	acre-
Time to Drain 97% of Inflow Volume =	38.1	59.8	58.5	56.8	52.2	50.0	hours
Time to Drain 99% of Inflow Volume =	39.8	63.0	63.1	62.6	60.7	59.8	hours
Maximum Ponding Depth =	2.94	3.95	4.57	5.02	5.77	6.03	ft
Maximum Ponded Area =	0.44	0.61	0.66	0.70	0.77	0.80	acres
Maximum Volume Stored =	0.422	0.957	1.352	1.656	2.212	2.412	acre-f



## **Stormwater Detention and Infiltration Design Data Sheet**

	DE		BASIN OUT			SIGN			
Proiect:	Homestead North	MH at Sterling Ranch	FD-Detention, Ver Filing No. 3	sion 4.05 (Janual	ry 2022)				
Basin ID:									
ZONE 3				Estimated	Estimated				
100-YB				Stage (ft)	Volume (ac-ft)	Outlet Type			
	T		Zone 1 (WQCV)	3.01	0.452	Orifice Plate			
	100-YEAR		Zone 2 (EURV)	4.46	0.823	Orifice Plate			
PERMANENT ORIFICES	ORIFICE		Zone 3 (100-year)	6.03	1.141	Weir&Pipe (Restrict)			
	Configuration (R	etention Pond)		Total (all zones)	2.416		1		
User Input: Orifice at Underdrain Outlet (typical	ly used to drain W	QCV in a Filtration	BMP)			1	Calculated Parame	ters for Underdra	in
Underdrain Orifice Invert Depth =	N/A		the filtration media	surface)	Underd	Irain Orifice Area =	N/A	ft <sup>2</sup>	
Underdrain Orifice Diameter =	N/A	inches			Underdrain	Orifice Centroid =	N/A	feet	
User Input: Orifice Plate with one or more orific			-				Calculated Parame		
Centroid of Lowest Orifice =	0.00 4.50		n bottom at Stage =	,	-	ce Area per Row =	N/A	ft <sup>2</sup> feet	
Depth at top of Zone using Orifice Plate = Orifice Plate: Orifice Vertical Spacing =	4.50 N/A	inches	n bottom at Stage =	= 010)		ptical Half-Width = ical Slot Centroid =	N/A N/A	feet	
Orifice Plate: Orifice Area per Row =	N/A	sq. inches				lliptical Slot Area =	N/A	ft <sup>2</sup>	
office flate. Office Area per Now -	in A	sq. menes			-	inplical Slot Area -	N/A	lic .	
User Input: Stage and Total Area of Each Orific	e Row (numbered	from lowest to hig	hest)						
	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)	
Stage of Orifice Centroid (ft)		1.50	3.00	3.25					
Orifice Area (sq. inches)	1.86	1.86	1.86	2.00					
				<b>-</b>			. <u></u>		_
	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)	)
Stage of Orifice Centroid (ft)									_
Orifice Area (sq. inches)									
Lloor Inputs Vertical Orifica (Circular or Doctors							Calculated Davama	tore for Vortical C	vifico
User Input: Vertical Orifice (Circular or Rectang	Not Selected	Not Selected	Т				Calculated Parame Not Selected	Not Selected	Driffice
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basir	bottom at Stage	– 0 ft) Ver	tical Orifice Area =	N/A	N/A	ft <sup>2</sup>
Depth at top of Zone using Vertical Orifice =	N/A	N/A N/A	ft (relative to basi	-		I Orifice Centroid =	N/A	N/A N/A	feet
Vertical Orifice Diameter =	N/A	N/A	inches	i bottom ut Stuge			in the second se	14/14	leet
	14/7	N/X	Inches						
User Input: Overflow Weir (Dropbox with Flat c	or Sloped Grate and Zone 3 Weir	d Outlet Pipe OR Re Not Selected	ectangular/Trapezoi	dal Weir and No O	utlet Pipe)		Calculated Parame Zone 3 Weir	ters for Overflow Not Selected	Weir
Overflow Weir Front Edge Height, Ho =	4.50	N/A	ft (relative to basin I	bottom at Stage = 0	ft) Height of Grate	e Upper Edge, H <sub>t</sub> =	4.50	N/A	feet
Overflow Weir Front Edge Length =	5.00	N/A	feet		Overflow W	/eir Slope Length =	5.00	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V	Gr	ate Open Area / 10	0-yr Orifice Area =	5.01	N/A	
Horiz. Length of Weir Sides =	5.00	N/A	feet		verflow Grate Open		17.40	N/A	ft <sup>2</sup>
Overflow Grate Type =	Type C Grate	N/A	_	C	Verflow Grate Ope	n Area w/ Debris =	8.70	N/A	ft <sup>2</sup>
Debris Clogging % =	50%	N/A	%						
User Input: Outlet Pipe w/ Flow Restriction Plate	e (Circular Orifice.	Restrictor Plate, or	Rectangular Orifice	)	Ca	Iculated Parameters	s for Outlet Pipe w/	Flow Restriction	Plate
oser input. Ouder tipe w/ new restriction had	Zone 3 Restrictor			4	<u></u>		Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below b	asin bottom at Stage	e = 0 ft) O	utlet Orifice Area =	3.48	N/A	ft <sup>2</sup>
Outlet Pipe Diameter =	30.00	N/A	inches		-	Orifice Centroid =	0.94	N/A	feet
Restrictor Plate Height Above Pipe Invert =	20.00		inches	Half-Cent	ral Angle of Restric		1.91	N/A	radians
		-							_
User Input: Emergency Spillway (Rectangular or							Calculated Parame		
Spillway Invert Stage=	5.90	`	n bottom at Stage =	= 0 ft)		esign Flow Depth=	0.78	feet	
Spillway Crest Length =	30.00	feet			5	op of Freeboard =	7.68	feet	
Spillway End Slopes =	4.00	H:V				op of Freeboard =	0.95	acres	
Freeboard above Max Water Surface =	1.00	feet			Basin Volume at T	op of Freeboard =	3.86	acre-ft	
Routed Hydrograph Results	The user can over	rride the default CL	IHP hydrographs an	d runoff volumes b	by entering new val	ues in the Inflow H	ydrographs table (C	Columns W throug	nh AF).
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	4.00
CUHP Runoff Volume (acre-ft) = Inflow Hydrograph Volume (acre-ft) =	0.452 N/A	1.275 N/A	1.247 1.247	1.860 1.860	2.411 2.411	3.199 3.199	3.813 3.813	4.614 4.614	8.451 8.451
CUHP Predevelopment Peak Q (cfs) =	N/A N/A	N/A N/A	3.2	9.0	13.6	24.4	30.6	39.2	76.8
	N/A	N/A							
OPTIONAL Override Predevelopment Peak Q (cfs) =		N/A	0.11	0.30	0.46	0.82 47.5	1.02	1.31	2.56
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A		170				56.5	67.8	122.0
Predevelopment Unit Peak Flow, q (cfs/acre) = Peak Inflow Q (cfs) =	N/A N/A	N/A	17.8	27.5	34.8		31.2	37.0	
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A N/A 0.2 N/A	N/A 0.4 N/A	0.4 N/A	5.4 0.6	11.5 0.8	23.1 0.9	31.2 1.0	37.0 0.9	96.3 1.3
Predevelopment Unit Peak Flow, q (cfs/acre) = Peak Inflow Q (cfs) = Peak Outflow Q (cfs) = Ratio Peak Outflow to Predevelopment Q = Structure Controlling Flow =	N/A N/A 0.2 N/A Plate	N/A 0.4 N/A Plate	0.4 N/A Plate	5.4 0.6 Overflow Weir 1	11.5 0.8 Overflow Weir 1	23.1 0.9 Overflow Weir 1	1.0 Overflow Weir 1	0.9 Outlet Plate 1	1.3 Spillway
Predevelopment Unit Peak Flow, q (cfs/acre) = Peak Inflow Q (cfs) = Peak Outflow Q (cfs) = Ratio Peak Outflow to Predevelopment Q = Structure Controlling Flow = Max Velocity through Grate 1 (fps) =	N/A N/A 0.2 N/A Plate N/A	N/A 0.4 N/A Plate N/A	0.4 N/A Plate N/A	5.4 0.6 Overflow Weir 1 0.3	11.5 0.8 Overflow Weir 1 0.6	23.1 0.9 Overflow Weir 1 1.3	1.0 Overflow Weir 1 1.8	0.9 Outlet Plate 1 2.1	1.3 Spillway 2.3
Predevelopment Unit Peak Flow, q (cfs/acre) = Peak Inflow Q (cfs) = Peak Outflow Q (cfs) = Ratio Peak Outflow to Predevelopment Q = Structure Controlling Flow = Max Velocity through Grate 1 (fps) = Max Velocity through Grate 2 (fps) =	N/A N/A 0.2 N/A Plate N/A N/A	N/A 0.4 N/A Plate N/A N/A	0.4 N/A Plate N/A N/A	5.4 0.6 Overflow Weir 1 0.3 N/A	11.5 0.8 Overflow Weir 1 0.6 N/A	23.1 0.9 Overflow Weir 1 1.3 N/A	1.0 Overflow Weir 1 1.8 N/A	0.9 Outlet Plate 1 2.1 N/A	1.3 Spillway 2.3 N/A
Predevelopment Unit Peak Flow, q (cfs/acre) = Peak Inflow Q (cfs) = Peak Outflow Q (cfs) = Ratio Peak Outflow to Predevelopment Q = Structure Controlling Flow = Max Velocity through Grate 1 (fps) =	N/A N/A 0.2 N/A Plate N/A	N/A 0.4 N/A Plate N/A	0.4 N/A Plate N/A	5.4 0.6 Overflow Weir 1 0.3	11.5 0.8 Overflow Weir 1 0.6	23.1 0.9 Overflow Weir 1 1.3	1.0 Overflow Weir 1 1.8	0.9 Outlet Plate 1 2.1	1.3 Spillway 2.3
Predevelopment Unit Peak Flow, q (cfs/acre) = Peak Inflow Q (cfs) = Peak Outflow Q (cfs) = Ratio Peak Outflow to Predevelopment Q = Structure Controlling Flow = Max Velocity through Grate 1 (fps) = Max Velocity through Grate 2 (fps) = Time to Drain 97% of Inflow Volume (hours) = Time to Drain 99% of Inflow Volume (hours) = Maximum Ponding Depth (ft) =	N/A N/A 0.2 N/A Plate N/A N/A 38 <b>40</b> 3.01	N/A 0.4 N/A Plate N/A N/A 68 72 4.46	0.4 N/A Plate N/A 67 72 4.31	5.4 0.6 Overflow Weir 1 0.3 N/A 70 76 4.79	11.5 0.8 Overflow Weir 1 0.6 N/A 68 75 4.99	23.1 0.9 Overflow Weir 1 1.3 N/A 66 74 5.29	1.0 Overflow Weir 1 1.8 N/A 64 73 5.47	0.9 Outlet Plate 1 2.1 N/A 62 71 5.82	1.3           Spillway           2.3           N/A           53           67           6.60
Predevelopment Unit Peak Flow, q (cfs/acre) = Peak Inflow Q (cfs) = Peak Outflow Q (cfs) = Ratio Peak Outflow to Predevelopment Q = Structure Controlling Flow = Max Velocity through Grate 1 (fps) = Max Velocity through Grate 2 (fps) = Time to Drain 97% of Inflow Volume (hours) = Time to Drain 99% of Inflow Volume (hours) =	N/A N/A 0.2 N/A Plate N/A N/A 38 <b>40</b>	N/A 0.4 N/A Plate N/A N/A 68 72	0.4 N/A Plate N/A N/A 67 72	5.4 0.6 Overflow Weir 1 0.3 N/A 70 76	11.5 0.8 Overflow Weir 1 0.6 N/A 68 75	23.1 0.9 Overflow Weir 1 1.3 N/A 66 74	1.0 Overflow Weir 1 1.8 N/A 64 73	0.9 Outlet Plate 1 2.1 N/A 62 71	1.3           Spillway           2.3           N/A           53           67



	POINT	TABULATION	
ID NO.	DESCRIPTION	NORTHING/EASTING	ELEVATION
1	MAINT. ROAD	N: 416925.58 E: 238346.46	7168.46
2	MAINT. ROAD	N: 416938.44 E: 238355.71	7168.53
3	MAINT. ROAD/ TOP	N: 416935.24 E: 238456.61	7163.00
4	MAINT ROAD/ TOP	N: 416947.47 E: 238458.76	7163.00
5	MAINT. ROAD/TOE	N: 416939.44 E: 238504.56	7157.84
6	MAINT. ROAD	N: 416951.39 E: 238503.52	7158.08
7	MAINT. ROAD/ TOE	N: 416952.98 E: 238521.59	7158.34
8	TOP	N: 416963.20 E: 238490.88	7163.00
9	TOP	N: 416976.40 E: 238523.13	7163.00
10	TOP	N: 417012.92 E: 238789.24	7163.00
11	SPILLWAY TOP	N: 417002.06 E: 238912.15	7163.00
12	SPILLWAY CREST	N: 416992.84 E: 238905.69	7161.01
13	SPILLWAY CREST	N: 416963.30 E: 238910.89	7161.01
14	SPILLWAY TOP	N: 416956.84 E: 238920.11	7163.00
15	SPILLWAY TOP	N: 416958.57 E: 238929.96	7163.00

TOE

N: 416884.87 E: 238547.58 7159.09

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	POINT	TABULATION			POINT	1
ID NO.	DESCRIPTION	NORTHING/EASTING	ELEVATION	ID NO.	DESCRIPTION	T
16	SPILLWAY CREST	N: 416967.79 E: 238936.42	7161.01	31	TOE	Ī
17	SPILLWAY CREST	N: 416997.34 E: 238931.22	7161.01	32	TOE	Ī
18	SPILLWAY TOP	N: 417003.80 E: 238922.00	7163.00	33	TOE	Ī
19	SPILLWAY CREST	N: 416995.96 E: 238923.38	7161.01	34	TOE	Ī
20	SPILLWAY CREST	N: 416994.22 E: 238913.53	7161.01	35	TOE	Ī
21	SPILLWAY CREST	N: 416966.41 E: 238928.58	7161.01	36	TRICKLE CHANNEL	Ī
22	SPILLWAY CREST	N: 416964.68 E: 238918.73	7161.01	37	TRICKLE CHANNEL	Ī
23	TOP	N: 416941.58 E: 238885.99	7163.00	38	BERM	Ī
24	TOP	N: 416923.08 E: 238832.47	7163.00	39	BERM	Ī
25	TOP	N: 416885.45 E: 238670.18	7163.00	40	BERM	
26	TOP	N: 416869.09 E: 238549.63	7163.00	41	BERM	Ī
27	TOP	N: 416917.40 E: 238488.30	7163.00	42	BERM	I
28	TOE/ FOREBAY	N: 416917.09 E: 238510.82	7157.49			
29	TOE	N: 416908.16 E: 238510.50	7158.27			

ID NO.	DESCRIPTION	NOR THING/EASTING	ELEVATION
31	TOE	N: 416903.70 E: 238666.80	7158.39
32	TOE	N: 416947.47 E: 238825.40	7156.68
33	TOE	N: 416976.57 E: 238873.97	7156.06
34	TOE	N: 416989.21 E: 238789.73	7157.09
35	TOE	N: 416959.79 E: 238537.88	7158.41
36	TRICKLE CHANNEL	N: 416970.22 E: 238868.98	7155.44
37	TRICKLE CHANNEL	N: 416927.35 E: 238520.44	7157.20
38	BERM	N: 416911.05 E: 238479.19	7163.00
39	BERM	N: 416859.17 E: 238550.91	7163.00
40	BERM	N: 416875.54 E: 238671.52	7163.00
41	BERM	N: 416893.67 E: 238736.21	7163.00
42	BERM	N: 416931.84 E: 238938.32	7163.97

